

	Castelfranco.		Turin.	Varese.		Novara.		Venice.	
	♂.	♂.	♀.	♂.	♂.	♂.	♀.	♀.	♀.
From snout to vent	48	43	58	55	54	45	58	56	56
Length of head	16	15	18	17	17	15	17	18	18
Width of head	15	14	18	18	18	15	18	18	18
Diameter of eye	5	4.5	5.5	5.5	5.5	5	5.5	6	6
Interorbital width	4	3.5	4.5	4.5	4	3.5	4	4.5	4
From eye to nostril	3.5	3.5	4	4	4	3.5	4	4	4
„ „ end of snout	7	6.5	8	8	7.5	6.5	8	8	8
Tympanum	3	2.5	3.5	4	3.5	2.5	4	3.5	4
From eye to tympanum	2	1.5	2.5	2	2	1.5	2	2	2
Fore limb	30	28	37	35	35	29	34	37	35
Hind limb	84	76	109	95	97	86	103	104	104
Tibia	28	25	36	33	32	28	35	35	34
Foot	26	24	32	31	32	28	34	33	32
Inner toe	6	5	7.5	6.5	7	6.5	7	7.5	6.5
Inner metatarsal tubercle	2	1.5	2.5	2.5	2.5	2	2.5	2.5	2

XLVII.—*Natural History Notes from H.M. Indian Marine Survey Steamer 'Investigator,' Commander R. F. Hoskyn, R.N., commanding.*—Series II., No. 1. *On the Results of Deep-sea Dredging during the Season 1890-91.* By J. WOOD-MASON, Superintendent of the Indian Museum, and Professor of Comparative Anatomy in the Medical College of Bengal, and A. ALCOCK, M.B., Surgeon I.M.S., Surgeon-Naturalist to the Survey.

[Continued from p. 286.]

Family Sergestidæ.

SERGESTES, H. M.-Edw.

22. *Sergestes bisulcatus*, W.-M.

Sergestes bisulcatus, W.-M. Ann. & Mag. Nat. Hist. (6) vii. 1891, p. 190, ♂ ♀.

A mutilated male and female from Station 109, 738 fathoms. Colour in the fresh state deep crimson.

23. *Sergestes mollis*, S. I. Smith.

Sergestes mollis, S. I. Smith, Rep. U. S. Fish. Comm. 1884, p. 419 [75], ♂ ♀, 1886, pl. xx. figs. 3-5, ♂ ♀.

Ann. & Mag. N. Hist. Ser. 6. Vol. viii.

A very fine male from Station 106, 1091 fathoms.

The spine at the distal end of the outer margin of the antennal scale is quite distinct, though small; the upper surface of the ocular peduncle is as if smeared with black pigment; and the subdorsal ridges of the telson bear near their distal end two pairs of very minute spinules.

Colour in life lurid red.

The specimen is very soft and delicate, and its carapace is hence much crumpled.

Total length from tip of rostrum to tip of telson 89 millim.

24. *Sergestes rubroguttatus*, sp. n.

Sergestes ? *arcticus*, W.-M. Ann. & Mag. Nat. Hist. (6) vii. 1891, p. 190, ♀ juv. (nec Krøyer).

♂ ♀. Closely allied to *Sergestes arcticus*, Krøyer (as figured by S. I. Smith in Bull. Mus. Comp. Zool. x. p. 96, pl. xvi. fig. 4, and Rep. U. S. Fish. Comm. 1884, p. 71, pl. viii. fig. 2, 1886, p. 92, pl. xx. figs. 1, 2), differing therefrom in the hepatic spine being so small as to be scarcely visible and sometimes obsolescent, in its longer and slenderer caudal appendages, and in the exopodites of these being without a trace of a spine on the outer margin.

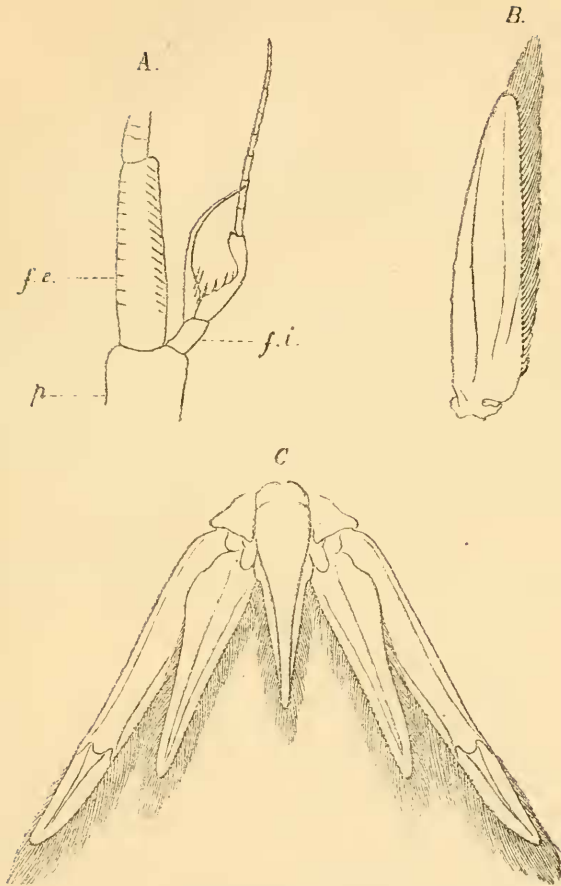
Colour in life hyaline, with blood-red spots.

Total length of a male 48 millim., of carapace from apex of rostrum to middle of hinder margin 15.5 millim., of external maxillipedes 32 millim., of the first pair of legs 25.5 millim., of the second pair 28.5 millim., of the third pair 31 millim., of the fourth pair 19 millim., of the fifth pair 9 millim.

The antennules of the male closely resemble those of *S. Frisi*, Kr. (Vid. Selsk. Skr. 5 Raekke, Naturvidens. og Mathem. Afd. 4 Bd. tab. i. fig. 1 c), the only difference being that the hook of the prehensile flagellum is roughened internally by fine, regularly parallel, transverse grooves or ridges instead of granules.

One female from Station 107, 738 fathoms; two males from Station 109, 738 fathoms; one female from Station 110, 1997 fathoms; and one male from Station 117, 1748 fathoms.

Fig. 10.



Sergestes rubroguttatus.

A, a portion of the left antennule of a male, from below, $\times 16.5$. *p*, apex of peduncle; *f.e.*, basal or olfactory portion of external flagellum, with traces of the primitive segmentation indicated on the left and the lines of insertion of the olfactory setae visible by transparency on the right of the drawing; *f.i.*, inner or prehensile flagellum.

B, left antennal scale, $\times 5$.

C, caudal swimmeret, $\times 5$.

EUKYPHOTES.

Family Glyphocrangonidæ.

GLYPHOCRANGON, A. M.-Edw.

Section 1.

25. *Glyphocrangon investigatoris*, W.-M., var. nov.
andamanensis.

Glyphocrangon investigatoris, Wood-Mason, Ann. & Mag. Nat. Hist. (6) vii. p. 191, ♀.

♀. Differs from the typical form in the following points:— It is much larger; the antennal, branchiostegal, and lateral spines of the carapace, especially the last-named, are more strongly developed, and the cervical groove is broader and deeper; the carapace with rostrum is, in proportion to the total length, somewhat shorter; the lateral and subdorsal ridges of the telson are much less distinctly and sharply granulated, being in fact little more than roughly waved; and, finally, the colour in life is uniform pink.

	Variety. millim.	Typical form. millim.
Total length from tip of rostrum to tip of telson	115	91
Length of carapace from middle of posterior margin to tip of rostrum . .	51	39
Length of carapace from front of the posterior rostral spines to middle of hinder margin	32	25·5
Length of rostrum from front of posterior spine to tip	20	15
Breadth between lateral spines of carapace	28·25	20·5
Length of abdomen	63	51

A young female differs from the above and from young of the same size and age of the typical form in its much longer rostrum, less tuberculate integument, longer and more divergent lateral carapacial spines, in all of which respects it recalls *G. aculeata*, A. M.-Edw.

The total length from tip of rostrum to tip of telson 55 millim., length of carapace from tip of rostrum to middle of posterior margin 26 millim., length of carapace from one of the posterior rostral spines to middle of hinder margin 13·5 millim., breadth between tips of lateral spines of carapace 14·8 millim., length of rostrum from front of one of the posterior spines 12·5 millim., length of abdomen 28·5 millim.

A very fine ovigerous female, with one young female, was taken at Station 115, 188 to 220 fathoms.

Colour in life in both pink; the eggs of the female pea-green. Colour of eyes in spirit dark purple.

26. *Glyphocrangon Smithii*, sp. n.

Very closely allied to *G. aculeata*, A. M.-Edw., from which it is distinguishable at a glance by the much less developed lateral spines of the carapace, the anterior of these being less expanded laterally and the posterior reduced to a minute though excessively acute point.

A comparison of our specimens with Milne-Edwards's type would probably reveal further differences.

Total length from tip of rostrum to tip of telson 77 millim., length of carapace from tip of rostrum to middle of posterior margin 35.5 millim., length of carapace from the front of one of the posterior rostral spines to hinder margin 20.5 millim., breadth between tips of lateral spines of carapace 18.2 millim., length of rostrum from the front of one of its posterior spines 16 millim., length of abdomen 41 millim.

Colour in life bright crimson. Eyes in spirit dark purple.

Two males from Station 112, 561 fathoms.

I have much pleasure in naming this species after Lieut. C. V. Smith, R.N., of the Survey.

Section 2.

27. *Glyphocrangon cæcescens*, sp. n.

Closely allied to *G. sculpta*, S. I. Smith, differing therefrom in the degeneration of its organs of vision, which, though perhaps not much if at all reduced in size, yet have their corneæ opaque yellow in every part except near the antero-lateral margins, where a faint touch of the original purple colour may still be traced; in having three pairs of rostral spines; in the rostrum being lanceolate when viewed from above (thus resembling that of *G. longirostris*, ♀ juv., S. I. Smith, Rep. U. S. Fish. Comm. 1886, pl. ix. fig. 5), and reaching nearly to the end of the olfactory flagellum of the antennules; in the dactylopodite of the legs of the last two pairs being minutely mucronate at the outer apex; in the posterior moiety of the subdorsal carapacial crest not being spinose; in the subdorsal ridges of the telson being minutely and acutely jagged.

Total length from tip of rostrum to tip of telson 65.5 millim., length of carapace from tip of rostrum to middle of

posterior margin 28·5 millim., length of carapace from front of second rostral spine to hinder margin 16 millim., length of rostrum from front of second spine to tip 12·75 millim., length of abdomen 37·5 millim.

Colour in life pale pink, with the corneæ dull yellow.

One male from Station 117, 1748 fathoms.

Section 3.

28. [*Glyphocrangon Gilesii*, W.-M.]

Glyphocrangon Gilesii, Wood-Mason, Ann. & Mag. Nat. Hist. (6) vii. p. 193, ♀.

We here record a second female, somewhat smaller than the type, which has come to light in the sorting of past seasons' collections. It was taken on April 12th, 1888, 7½ miles east of North Cinque Island, Andaman Sea, in 490 fathoms.]

29. *Glyphocrangon caeca*, sp. n.

♂ ♀. This species differs from all the members of its own section in the enormous development of the spines of the anterior moiety of its lateral carapacial ridges, which are extended beyond the level of the frontal margin as in the species of Section 1, and from all the species of its genus in its greatly degenerate organs of vision, which, besides being somewhat reduced in size, have the corneæ yellow and densely opaque throughout. Both moieties of the lateral and the posterior moiety of the sublateral ridges are thick, blunt, and entire, but all the other ridges are broken up into tubercles; the subdorsal ridge is represented by six spiniform tubercles—three on each division of the carapace—the dorsal by six, of which two are behind the cervical groove and four in front of it; the latter have two closely-parallel rows of much smaller tubercles between them and their fellows of the opposite side; a minute median spinule projects from the anterior end of the gastric region over the gastro-rostral groove; between the anterior ends of the posterior moieties of the dorsal and subdorsal ridges an oblique row of four rather large granules bounds that portion of the cervical groove posteriorly.

With these exceptions the carapace is smooth and bears between its anterior lateral ridge and the gastric region on each side an unusually distinct low oval swelling. The antennal spine is unusually small—scarcely half the size of

the branchiostegal and only about one and a half times as large as the anterior rostral spines. The rostrum, which extends beyond the antennulary peduncle by about the length of the lateral spine of the carapace, is somewhat recurved and is marked on the dorsal surface by two rows of elongate foveæ, which are much more distinct in the female than in the male; its spines are small, especially the posterior, which are rather short and stout. The broadly oval antennal scale all but reaches the level of the end of the antennulary peduncle; the spine of its outer margin is rather well developed and is placed about one third of the way from the base to the apex.

The eyes are in both sexes somewhat reduced, in our only female very unequally so—the right being scarcely half the size of the left, while in our two males they would appear to be quite equal on both sides. From the opaqueness of the corneæ and other marks of degeneration it may with confidence be inferred that this species is quite blind.

The olfactory flagellum of the antennules is much thicker in the male than in the female. The dactylopodites of the last two pairs of legs are of the ordinary form—lanceolate, with the dorsal surface concave and the ventral subcarinate.

Abdomen much as in the preceding and probably other members of the same section; the dorsal ridge of its last tergum is in the female entire, in both males obsoletely notched; the dorsal ridge of the telson seems unusually long.

Colour in life bright pink.

	Male. millim.	Female. millim.
Total length from tip of rostrum to tip of telson	53·5	64
Length of carapace from tip of rostrum to middle of posterior margin . . .	22	25
Length of carapace from front of posterior rostral spine to hinder margin	12·5	15
Length of rostrum from front of posterior rostral spine to tip	10	12
Length of abdomen	31·5	38
Breadth between points of lateral spines	12·3	13·6

Two males and one ovigerous female were taken at Station 112, 561 fathoms.

Family Crangonidæ.

Subfamily CRANGONINÆ.

CRANGON, Fabr.

The two following species belong to the same section of the genus as *Crangon Sarsii*, Lilljeborg.

30. *Crangon bengalensis*, sp. n.

♀. Rostrum acuminate triangular, the unarmed tip extending by about half its length beyond the level of the eyes, armed at the sides with three pairs of sharp spines, of which the basal pair is only slightly more distant from the second pair than this is from the third pair. Eyes very short, owing to the reduction in length of the basal joint.

Median dorsal carina of the carapace divided into five forwardly-directed sharp spines; subdorsal carinæ continuous with the sides of the rostrum, also 5-spinose, with a considerable unarmed interval between its foremost spine and the basal rostral spine with which it is continuous; sublateral carinæ 3-spinose in their anterior half, ending abruptly some distance from the extra-orbital spines with which they are in line; lateral carinæ continuous with the antennal spines, unispinose near the anterior end; marginal carinæ entire, unarmed, continuous with the branchiostegal spines. The first abdominal tergum is furnished with six anteriorly spinose carinæ—two dorsal, two subdorsal, and two sublateral—as well as with unarmed rudiments of two lateral carinæ; the second tergum with three similar carinæ, of which one is dorsal and two are subdorsal, as well as with two unarmed sublaterals; the third and fourth terga have only an obtuse median dorsal carina, which in the latter is produced in the middle line posteriorly into a small point, as well as indistinct remains of sublaterals; the fifth and sixth have two posteriorly somewhat divergent sharp dorsal carinæ, which in the latter are minutely unispinose rather behind the second third of their length; the fifth has also two lateral carinæ and the sixth one.

Eyes in spirit dark chocolate-brown.

Total length from tip of rostrum to tip of telson 44 millim.; length of carapace from tip of rostrum to middle of posterior margin 13·5 millim., of abdomen to end of telson 30·5 millim.

One ovigerous female from Station 120, 240 to 276 fathoms.

31. *Crangon andamanensis*, sp. n.

Closely allied to the preceding, from which it differs in the following points:—(1) The two apical pairs of rostral spines are equidistant between the tip of the rostrum and the basal pair; (2) the rostrum is not so acuminate, its terminal portion being more broadly triangular; (3) the subdorsal carinæ of the carapace are only 4-spinose, the sublaterals are 5-spinose, and the laterals are usually bispinose; (4) the dorsal carina

of the second abdominal tergum is bispinose, and the dorsal carinæ of the sixth are 3- or 4-spinose; (5) it is a much larger and altogether finer species.

	Male. millim.	Female. millim.
Total length from tip of rostrum to tip of telson	62	72
Length of carapace from tip of rostrum to middle of posterior margin	18	20
Length of abdomen to end of telson . .	43.5	50

Colour in life chalky yellow. Eyes in spirit dark chocolate-brown.

Four males and two ovigerous females from Station 115, 188 to 220 fathoms.

PONTOPHILUS, Leach.

32. *Pontophilus gracilis*, S. I. Smith.

Pontophilus gracilis, S. I. Smith, Bull. Mus. Comp. Zool. 1882, x. p. 36, pl. vii. figs. 2-3 a; Rep. U. S. Fish. Comm. 1886, pl. xi. figs. 1, 2 (nec Sp. Bate, 'Challenger' Macrura, 1888, p. 487, pl. lxxxvii.).

One fine ovigerous female from Station 112, 561 fathoms, and a small and somewhat mutilated specimen from Station 113, 683 fathoms.

Colours in life transparent cloudy purple, corneæ milky orange. (In spirit rich orange-coloured and opaque.)

33. *Pontophilus abyssi*, S. I. Smith.

Pontophilus abyssi, S. I. Smith, Rep. U. S. Fish. Comm. 1884, p. 19, ♂ ♀, 1886, p. 49, pl. xi. figs. 3-5, ♂ ♀.

A fine female from Station 110, 1997 fathoms.

Colour in life translucent cloudy purple (dark orange in spirit), with the corneæ milky or chalky orange (in spirit Indian yellow and opaque).

Also a mutilated ovigerous female from Station 117, 1748 fathoms. Colour in the fresh state purplish, corneæ dull yellow. (In spirit as in the preceding specimen.)

The eyes in this species are decidedly shorter and less produced at the inner apex than in the preceding.

PRIONOCRANGON, gen. nov.

Integument smooth and polished. Carapace compressed, armed with a short, sharp, ascendant, narrow, triangular

ostrum, with antennal spines and with an arched median, dorsal, spiny crest on the gastric region. There is no trace either of eyes or even of eye-peduncles. First and third pairs of legs of the usual Crangonine form; second pair non-chelate, rather robust, with fringes of long plumose setæ, their dactylopodites minute, setulose; third and fourth pairs rather more robust than, but similar to, the second, with successively more minute and less gressorial dactylopodites, also furnished with long fringes of plumose setæ. Abdomen compressed, smooth, transversely convex, without spines or carinæ. Telson thin and depressed.

34. *Prionocrangon ommatosteres*, sp. n.

The serrated gastric crest is seven-toothed.

The animal measures in length, from tip of rostrum to tip of telson, about 30 millim., of which the carapace from tip of rostrum to middle of hinder margin is about 10 millim.

A single somewhat mutilated specimen from Station 116, 405 fathoms.

[To be continued.]

XLVIII.—*The Biological Import of Amitotic (Direct) Nuclear Division in the Animal Kingdom.* By H. E. ZIEGLER, Ph.D., Extra-ordinary Professor of Zoology, Freiburg i. B.*

In W. Flemming's most recent paper † we find the following passage:—"As regards the fragmentation of the nuclei of leucocytes—and amitotic nuclear division in general—it appears to me not impossible that the following view could also be held. The leucocytes, like the cells of other tissues, perform their normal physiological reproduction by means of mitosis; those cells only which have come into existence by this process preserve the faculty of continuing to live and of producing similar cells in the same manner. *Fragmentation of the nucleus, with and without subsequent division of the cell, is universally a process in the tissues of Vertebrates, which*

* Translated from the 'Biologisches Centralblatt,' Bd. xi. nos. 12 and 13, pp. 372-389, July 15, 1891.

† W. Flemming, "Ueber Teilung und Kernformen bei Leukocyten und über deren Attraktionsphären," Archiv f. mikr. Anatomie, 37 Bd., 1891.